APPENDIX A

Sample HTML Source For An SS-DHTML Document Object

```
<html>

<head>
<title></title>
</head>

<body bgcolor="#C0C0C0">
<script Language="JavaScript1.2">
<!--
      function signForm() {
        var alltext = new String(document.po.T1.value +
document.po.T2.value + document.po.T3.value + document.po.S1.value +
document.po.T4.value);
        var ret;
        ret = document.Invisible.processInput(document.forms[0],
alltext);
          alert (ret);
      }
//-->
</script>
<em><big><font face="Arial Black">

<p>Form #1176 Purchase Order Request:</font></big></em>

    <APPLET Name = "Invisible" CODE = "InvisibleApplet.class" ARCHIVE =
"invisible.jar" WIDTH = 350 HEIGHT = 350 >
    </APPLET>

</p>
<a href="http://st9:8080/SWBCDemos/Forms/formsOnline.htm"><font
face="Garamond"><strong>

<p align="center">I want To Return To The Main Forms Page
</strong></font></a></p>

<hr size="3" width="50%" align="center">

<form name="po">
  <b><strong><big><big><p>Employee Name:</big></big></strong>
</b><input type="text"
  name="T1" size="30"> <br>
  <br>
  <b><strong><big><big>Product Name:</big></big></strong> </b><input
type="text" name="T2"
  size="35"> <br>
  <br>
  <b><strong><big><big>Reasons For Order:</big></big></strong> </b><br>
```

```
  <textarea rows="9" name="S1" cols="38"></textarea> <br>
  <br>
  <big><big><strong>Quantity:</strong></big></big></p>
  <p><select name="D1" size="1">
    <option selected value="1">1</option>
    <option value="2">2</option>
    <option value="3">3</option>
    <option value="4">4</option>
    <option value="5">5</option>
  </select>   <big><strong>Other: (Please
Specify)</strong></big> <br>

            
;  <input
  type="text" name="T4" size="20"></p>
  <p><big><big><strong>Price:</strong></big></big></p>
  <div align="left"><p><input type="text" name="T3" size="20"></p>
  </div><div align="center"><center><p><br>
  <input type="button" value="Submit Order" name="B1"
onClick="signForm()"> <input
  type="reset" value="Reset Fields" name="B2"></p>
  </center></div><hr size="3" width="50%" align="center">
</form>
</body>
</html>
```

Sample Java™ Signature Processing Applet For An SS-DHTML Document Object

```
/*****************************************************************/
/* file - InvisibleApplet.java
/* --------------------------
/* This is the class definition for the applet that works throught
/* LiveConnect with the forms in the Form Signature demonstration
/* This applet holds two responsibilites:
/* 1 - Authenticate the user and obtain their private key
/* 2 - Accept throught a call from a JavaScript a reference to a form
/*     object and user specific data and sign this concatenated data
/*     with the private key obtained from authentication
/* --------------------------
/* Revision Timeline:
/* 6/5 - 6/9 Attempted implementation of iButtons to perform authent
/* 6/10 Decided a software implementation was a better starting point
/* 7/14 Moved search for user's private key to method that signs data *
/*****************************************************************
/
import com.ms.security.*;
import java.security.*;
import java.io.*;
import java.util.*;
import java.net.*;
import com.oreilly.servlet.*;
import javax.crypto.*;
import javax.crypto.spec.*;
import javax.crypto.spec.PBEKeySpec;
import au.net.aba.crypto.provider.ABAProvider;
import au.net.aba.crypto.*;
import au.net.aba.security.spec.*;

public class InvisibleApplet extends java.applet.Applet {

    Instruct s = new Instruct();
    Message resul = new Message();
    SymAction lSymAction = null;
    Password p = new Password();
    PrivateKey session_key = null;
    PublicKey verify_key = null;
    byte[] sig = null;
    int fails = 0;
    boolean flag = false;
    BASE64Encoder coder = new BASE64Encoder();
    BASE64Decoder decoder = new BASE64Decoder();
    String encodedPubKey = "";

    byte[] salt = new byte[8];
    int iterations = 20;

    /*****************************************************/
```

```
    /* The initialization method of the applet. Here there*/
    /* are two main purposes. 1: Authenticate the user    */
    /* this will be done by what ever method chosen and 2:*/
    /* Obtain the users private key off the floppy drive. */
    /*****************************************************/
    public void init() {

      try {

          System.out.println("---------------------------------");
          System.out.println("Secure Web Based Computing Test Bed");
          System.out.println("\nOnline Form System Demonstration");
            System.out.println("Version 4.00");
          System.out.println("---------------------------------\n");

           // Written solely for the Win32 VM. Since this is the init()
           // method we need to assert our specified permission to the
           // call stack in order to display a window giving
instructions
           if (Class.forName("com.ms.security.PolicyEngine") != null) {
          PolicyEngine.assertPermission(PermissionID.SYSTEM);
            }

          Security.addProvider(new ABAProvider());

          resul.setSize(400,200);

          try {

              encodedPubKey = getParameter("publicKey");

            if (encodedPubKey == null) {
                s.setVisible(true);
            }

          }catch (Exception e) {

              // Set the instructions dialog box visible
              s.setVisible(true);
            System.out.println(e);

          }

          // Declare an instance of the ActionHandling class
            // And attach listeners to each of the buttons
          lSymAction = new SymAction();
          p.button1.addActionListener(lSymAction);
          s.button1.addActionListener(lSymAction);
          resul.button1.addActionListener(lSymAction);

        }catch (Exception e) {
        System.out.println("Caught Exception in Applet Init():" + e);
        }

    } /* End init() */

    /*********************************************************/
```

```
    /* This method added 7/14 to run the verification and     */
    /* its parameters to be obtained from the script that will*/
    /* call it. The servlet the hands this page to the client */
    /* will have encoded the public key in the page as a      */
    /* parameter to obtain                                    */
    /*********************************************************/
    public boolean processVerify(String form, String client_input,
String signature) {
      byte[] temp       = null;
      byte[] temp1      = null;
      byte[] sig        = null;
      byte[] ser_pubKey = null;
      byte[] fin        = null;
      boolean result    = false;

      try {
          System.out.println(signature);

          try {
              sig = decoder.decodeBuffer(signature);
          }catch (Exception e) {
            e.printStackTrace();
          }

      System.out.println("Client input in verify: " + client_input);

      ser_pubKey = decoder.decodeBuffer(encodedPubKey);
      ByteArrayInputStream bais = new ByteArrayInputStream(ser_pubKey);
      ObjectInputStream ois = new ObjectInputStream(bais);
      verify_key = (PublicKey) ois.readObject();
      ByteArrayOutputStream baos1 = new ByteArrayOutputStream();
      PrintWriter pw = new PrintWriter(baos1);
      pw.flush();
      pw.println(form);
      pw.flush();
      pw.close();
      temp1 = baos1.toByteArray();
      BASE64Encoder be = new BASE64Encoder();
      System.out.println("In Verify rep of form: " + be.encode(temp1));

       String concat = client_input;

      ByteArrayOutputStream baos = new ByteArrayOutputStream();
      ObjectOutputStream oos = new ObjectOutputStream(new
      BufferedOutputStream(baos));
       oos.writeObject(concat);
       oos.close();
       temp = baos.toByteArray();

       fin = new byte[temp.length + temp1.length];

       System.arraycopy(temp, 0, fin, 0, temp.length);
       System.arraycopy(temp1, 0, fin, temp.length, temp1.length);

       // Declare an instance of the DSA signature class from the JCA
       Signature dsa = Signature.getInstance("DSA");
       dsa.initVerify(verify_key);
```

```
        dsa.update(fin);
        result = dsa.verify(sig);

        System.out.println(result);

      }catch (Exception e) {
          System.out.println(e);
      }

      return result;

    } /* end processVerify() */

    /*************************************************************/
    /* Here is the workhorse method of the applet: The params    */
    /* to this applet are the reference to the form and the      */
    /* concatenated form input as one string. This information   */
    /* will also be concatenated and signed.                     */
    /*************************************************************/
    public String processInput(String form, String client_input) {

        // Declare a byte array that will eventually hold the
        // signature on all the data supplied to the method
        byte[] tmp = null;
      byte[] tmp1 = null;
        byte[] fin = null;

      String return_value = "";

      // As an added check, determine if the private key
        // to user is null
        if (session_key == null) {
          System.out.println("There was a problem setting the private
key");
      }else {
            System.out.println("Before try statement");

            try {

        ByteArrayOutputStream baos1 = new ByteArrayOutputStream();
        PrintWriter pw = new PrintWriter(baos1);
        pw.flush();
        pw.println(form);
        pw.flush();
        pw.close();
        tmp1 = baos1.toByteArray();

        BASE64Encoder be = new BASE64Encoder();
        System.out.println("In Sign rep of form: " + be.encode(tmp1));

        String concat = client_input;
        ByteArrayOutputStream baos = new ByteArrayOutputStream();
        ObjectOutputStream oos = new ObjectOutputStream(new
      BufferedOutputStream(baos));
        oos.writeObject(concat);
        oos.close();
        tmp = baos.toByteArray();
```

```
        fin = new byte[tmp.length + tmp1.length];

        System.arraycopy(tmp, 0, fin, 0, tmp.length);
        System.arraycopy(tmp1, 0, fin, tmp.length, tmp1.length);

        // Declare an instance of the DSA signature class from the JCA
        Signature dsa = Signature.getInstance("SHA/DSA");
        dsa.initSign(session_key);
        dsa.update(fin);

        // And sign the input from the client
        sig = dsa.sign();

         }catch (Exception e) {
         System.out.println(e);
          }


      // In case of error where signature was not created properly
      // examine the byte array
         if (sig != null) {

      // Here the signature is fine so return it to the calling
      JavaScript
         return_value = coder.encode(sig);

          }else {

       // Here the signature was not fine so to avoid a
    NullPointerException
       // assemble a random byte array and inform the user of the
    problem
        System.out.println("The objects were not properly stored
    together");
         tmp = new byte[1];
         return_value = tmp.toString();
        }

       }
     return return_value;

} /* End processInput() */

/*********************************************/
/* Action Handling Class for AWT components   */
/*********************************************/
class SymAction implements java.awt.event.ActionListener {

    // decide which component was triggered and execute appropriate
    // handler for it
    public void actionPerformed(java.awt.event.ActionEvent event) {

        try {

      Object object = event.getSource();
```

```
        if (object == s.button1) {
            sButton1_ActionPerformed(event);
            }

        if (object == p.button1) {
            pButton1_ActionPerformed(event);
            }

        if (object == resul.button1) {
           resul.setVisible(false);
        }

        }catch (NullPointerException e) {
            System.out.println(e);
        }

    } /* End actionPerformed() */

} /* End Inner class SymAction() */


/**********************************************************/
/* Action Handling method for the Continue button on the  */
/* Instructions form, class Instruct                      */
/**********************************************************/
void sButton1_ActionPerformed(java.awt.event.ActionEvent event) {

  try {

  // User acknowledged inserting his private key disk into floppy
  // now he wants to continue, so minimize this dialog box
        s.setVisible(false);

  // To Check and see if there is a disk in the floppy drive
  // Form a file instace of A:\. Any NullPointerException will
  // indicate that the user has not inserted a disk
      File testFile = null;
      String floppy_test = ("A:" + File.separator);
      testFile = new File(floppy_test);

      if ((testFile.exists()) == false) {
          try {
            fails++;
                  s.wrappingLabel1.setText("There is no disk in the
  floppy drive, please try again");
            s.setVisible(true);
          }catch (Exception e2) {
            System.out.println(e2);
            }
      }else {

        if (fails < 3) {
   // And present the user with a chance to enter their password
   // by showing the password dialog box
                p.setVisible(true);
        }else {
            }/* end inside else{} */
```

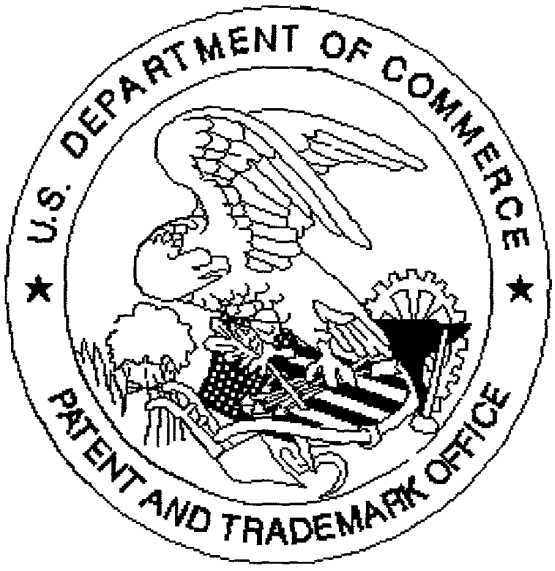
```
        }

    }catch (NullPointerException e) {

     // Depending on which VM is used, a file instance that does not
    exist
     // can throw a NullPointerException, so catch for it here
     // Since the above test for the floppy failed, redisplay the
     // Instruct instance will the following instructions
        try {

         s.wrappingLabel1.setText("No disk could be located in the
    floppy drive, please try again.");
         s.setVisible(true);

        }catch (Exception e1) {
            System.out.println(e1);
        }

      }catch (Exception e) {
        // Catch all other exceptions
        System.out.println(e);
      }

} /* End sButton1_ActionPerformed() */

/*************************************************************/
/* Action Handling method for the Password Dialog Box        */
/* This is where the private key will be obtained from the   */
/* floppy drive                                              */
/*************************************************************/
void pButton1_ActionPerformed(java.awt.event.ActionEvent event) {

  try {

      // Minimize the password dialog box
      p.setVisible(false);
      resul.setVisible(true);
      resul.textArea1.append("Searching For Employee Information
    File....");

      // Now is time to check if user inserted correct disk,
      // File where data is held is titled by username, if no file
      // Exists then a FileNotFoundException will be thrown
      String path = new
      String("A:"+File.separator+p.textField1.getText());
      System.out.println("Debug File Path" + path);
      FileInputStream infoHandle = new FileInputStream(path);

      // A valid file existed if execution reaches this point,
      begin the input
      // of the object containing the private key
      ObjectInputStream ois = new ObjectInputStream(infoHandle);
      resul.textArea1.append(" Done\n");

      x509 temp = null;
```

```
        resul.textArea1.append("Decrypting Encoded Signature
        Key...");

        // An appropriately Named Files exists on the disk, try to
        extract
        // an Instance of x509 from it
        try {
        temp = (x509) ois.readObject();
        }catch (Exception e1) {
         e1.printStackTrace();
        }


        // Declare the Secret Key and factory used to generate it
          KeySpec ks = new
          PBEKeySpec((p.textField2.getText()).toCharArray());
        SecretKeyFactory skf =
        SecretKeyFactory.getInstance("PBEWithMD5AndDES");
        SecretKey key = skf.generateSecret(ks);

        // Declare the new salt to use in decryption
          byte[] salt = temp.salt;


    // Create an instance of the parameter spec to encapsulate all
    // parameters to the cipher in one class
        AlgorithmParameterSpec aps = new PBEParameterSpec(salt,
    iterations);

        // Create an instance of the Cipher that will decrypt the key
        Cipher cipher = Cipher.getInstance("PBEWithMD5AndDES");

        // This is a symmetric cipher so initialize it to decryption
        mode
        cipher.init(Cipher.DECRYPT_MODE, key, aps);

        // And decrypt it
          byte[] serialized_key =
          cipher.doFinal(decoder.decodeBuffer(temp.passwd));
        resul.textArea1.append(" Done\n");

        resul.textArea1.append("Extracting Private Key From Decrypted
    Data...");

        // Extract the serialized object from the decrypted key
          ByteArrayInputStream bais = new
          ByteArrayInputStream(serialized_key);
        ObjectInputStream ois2 = new ObjectInputStream(new
        BufferedInputStream(bais));

        // And make sure it is the DSA private key
        session_key = (PrivateKey) ois2.readObject();
        resul.textArea1.append(" Done\n");

        resul.textArea1.append("You Many Now fill Out Your Form, to
        submit press the submit button.");
```

```
        }catch (FileNotFoundException e) {

            try {

              // The file does not exist on the disk that the client
              // Inserted so inform the client of this.
              fails++;
              p.setVisible(false);
                s.wrappingLabel1.setText("No such identification exists
              on this disk, please try again");

              // Show the alert box
              s.setVisible(true);

            }catch (Exception e3) {
              System.out.println(e3);
            }

        }catch (Exception e) {

            e.printStackTrace();

          }/* End outermost try{}catch{} */

    } /* End pButton1_ActionPerformed() */

} /* End InvisibleApplet() */
```

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division



SCANNED, # 12

Application deficiencies found during scanning:

☐ Page(s)_____ of _____ were not present for scanning. (Document title)

☐ Page(s)_____ of _____ were not present for scanning. (Document title)

* From page 31 to 41 Appendix a part of Specification.

☐ ***Scanned copy is best available.***